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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,528	03/30/2001	Han-Ming Wu	4290P10627	7457

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EXAMINER	
KACKAR, RAM N	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/823,528	WU ET AL.	
	Examiner	Art Unit	
	Ram N Kackar	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7-14,30 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-14,30 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 7 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogawa Kaoru (JP 04144130)

Ogawa Kaoru discloses a plasma chamber (Abstract and Fig 3), a solid shield plate and a support structure for the shield plate (Fig 3). Regarding the claim of the shield being stationary, it is an intended use limitation. The shield of Ogawa Kaoru does not have to rotate.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims1-4, 7-11, 13-14 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa Kaoru (JP 04144130) in view of Lenz et al (US 5534751) and Ilya Perlov (US 5421893).

Ogawa Kaoru discloses a plasma chamber for etching (Abstract and Fig 3), a circular (solid) shield plate to control the distribution of ion density on the substrate and a support structure for the shield plate (Fig 3).

Ogawa Kaoru does not explicitly disclose the thickness of the shield plate and that the plate and supporting structure is made of dielectric material.

Lenz et al disclose a plasma chamber (Fig 1), a circular shield plate with rounded corner edges (Col 7 line 16) and a support structure for the shield plates (Fig 2 and Col 6 lines 16-26), made of dielectric to confine the plasma (to actively direct ion flux) and a support structure also of dielectric having 6 support members (Fig 2) and the thickness of shield plate being 2.4 mm (Col 7 line 8). The apparatus disclosed by Lenz et al discloses that the apparatus could be used for etching or CVD.

Therefore it would have been obvious for one of ordinary skill in the art at the time invention was made to have a dielectric shield of thin material so as to control the ion density at the substrate in a predictable way by maintaining insulation of the shield in order to have uniformity of etching. Also, it would be obvious to hold the shield stationary for its simplicity in order to do processes, which do not require the area of plasma shielded, to be variable.

Omission of an element with a corresponding omission of function is within the level of ordinary skill. *In re Wilson* 153 USPQ 740 (CCPA 1967); *In re Portz* 145 USPQ 397 (CCPA 1965); *In re Larson* 144 USPQ 347 (CCPA 1965); *In re Karlson* 136 USPQ 184 (CCPA 1963); *In re Listen* 58 USPQ 481 (CCPA 1943); *In re Porter* 20 USPQ 298 (CCPA 1934).

Lenz et al disclose support structure having six supports but do not disclose support structure with three members.

Having six or three support members for a circular object is common and depends upon the mechanical support needed.

Ilya Perlov discloses a common support structure using a spider of three vertical members (Fig 1).

Therefore having a support of three members would have been obvious for one of ordinary skill in the art at the time of invention.

Regarding claim 8, as the shape and dimension of the shield plate determines the ion density distribution it would be obvious to optimize that according to size of substrate, plasma chamber and process requirement.

Regarding claims 10-11, mean free path is a process parameter dependent upon pressure. Obviously, the dimensions of the apparatus depend upon the process parameters and are therefore optimized accordingly as a routine.

Regarding claim 31 reticle is a substrate and is an object to be worked on and not a part of the apparatus.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa Kaoru (JP 04144130) in view of Lenz et al (US 5534751) and Ilya Perlov (US 5421893) as applied to claim 1 and further in view of Henderson et al (US 6008130).

Ogawa Kaoru discloses a plasma chamber (Fig 3), a circular (solid) shield plate and a support structure for the shield plate (Fig 3-3).

Ogawa Kaoru or Lenz et al disclose shield plates and a support structure for the shield plates but do not explicitly disclose fully rounded edges.

Henderson et al disclose a plasma chamber (Fig 1), shield plates with rounded corner edges and a support structure for the shield plates (Fig 1-32).

Therefore it would have been obvious for one of ordinary skill in the art at the time invention was made to have a rounded edge of the shield plate for safety reason as well as not to have deposits, which could easily flake off.

Response to Amendment

6. Applicant's arguments filed 5/19/2004 have been considered but not found persuasive.

Applicant argues that the shield in Kaoru is not circular.

As discussed above, the shape and dimension of the shield plate determines the ion density distribution. It would therefore be obvious in general to make it symmetrical to the substrate and the susceptor. However the susceptor is circular and is not disclosed to be any odd shape it is obvious that the shield plate would be circular.

Applicant argues that the shield in Kaoru is not disclosed to be supported by a structure of three supports.

As discussed above three support members for a circular object is common and seen many places like in vertical wafer boats and spider type support as disclosed above.

Applicant argues that support structure of Lenz would not allow the shield of Kaoru to rotate.

In Kaoru the rotation of the shield is only to provide adjustability and is not needed during processing.

Applicant argues that Henderson discloses only annular corners to be rounded off.

Henderson discloses top and bottom edge of shield rings facing the plasma environment rounded off since those edges only affect the process and plasma. The solid shield has only top

and bottom edge facing the plasma. Rounding of these edges as per the teaching of Henderson would have been sufficient and obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 571 272 1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RK

P. Hassanzadeh
primary Examiner
AU 1763